

The StratoCruiser Propulsive Long Endurance Balloon Gondola, Phase I

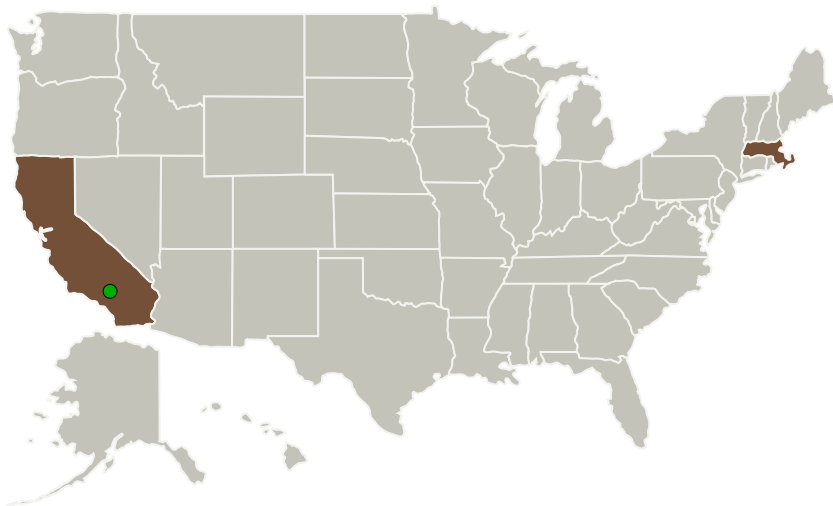
Completed Technology Project (2014 - 2014)



Project Introduction

New measurement technologies are required to support science campaigns to better quantify rapid loss of permanent floating ice volume in the Arctic Ocean, accelerating loss of the Greenland glacial system, recurring drought conditions in the U. S. continental interior, and increasing frequency and intensity of severe storms in both coastal zones and in the nation's central corridor. While balloon measurements offer persistence and relative low cost when compared to aircraft systems, they lack the ability to reposition, station-keep, or navigate along or across observed gradients. Similarly, aircraft offer the ability to target regional phenomenon, reposition, and navigate to areas of interest but are costly to operate and lack the persistence of balloons. The StratoCruiser balloon gondola concept offers unprecedented mobility and the reel-down payload support for executing unique in-situ studies of large-scale convective events. Combining the persistence of balloon platforms, the vertical measurements of soundings, and the mobility of aircraft the StratoCruiser will enable new understanding of stratospheric phenomenon. The StratoCruiser carries the unique Harvard-designed reel-down payload and winch system. The winch allows the suspended payload to be lowered from a vehicle at rates of 5-10 m/s up to a distance of 10 km. These soundings provide in situ detection of radicals, isotopes, ozone, reactive intermediates, long-lived tracers and condensed and vapor phase H₂O and HDO.

Primary U.S. Work Locations and Key Partners



The StratoCruiser Propulsive Long Endurance Balloon Gondola Project Image

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
● Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

Primary U.S. Work Locations	
California	Massachusetts

Project Transitions

▶ **June 2014:** Project Start

✓ **December 2014:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140755>)

Images



Project Image

The StratoCruiser Propulsive Long Endurance Balloon Gondola Project Image
(<https://techport.nasa.gov/image/130683>)

Project Management

Program Director:

Jason L Kessler

Program Manager:

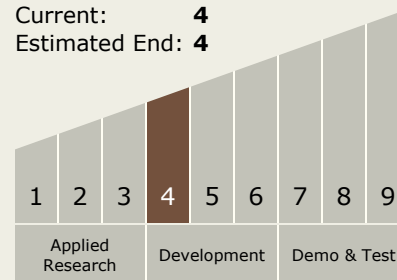
Carlos Torrez

Principal Investigator:

Justin McClellan

Technology Maturity (TRL)

Start: 4
Current: 4
Estimated End: 4



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - TX08.3 In-Situ Instruments and Sensors
 - TX08.3.4 Environment Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System